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Earnings of Postsecondary Graduates by Detailed Field of Study

by Marc Frenette and Kristyn Frank

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0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
^{p} preliminary
^{r} revised
x suppressed to meet the confidentiality requirements of the *Statistics Act*
^{E} use with caution
F too unreliable to be published
* significantly different from reference category ($p < 0.05$)

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Earnings of Postsecondary Graduates by Detailed Field of Study

by Marc Frenette and Kristyn Frank, Social Analysis and Modelling Division

This *Economic Insights* article documents age-adjusted mean earnings by detailed field of study among 25- to 54-year-old university and college graduates who worked full year, full time in 2010. The data are drawn from the 2011 National Household Survey. The results suggest that management sciences and quantitative methods graduates were the top earners among male and female bachelor's degree holders in 2010. The study also finds that earnings vary considerably among graduates from specific fields of study that are typically grouped together (e.g. economics graduates earn more than graduates from other social science programs, such as sociology and psychology).

Introduction

Perhaps the most important decision that postsecondary students make is what to study since the choice is closely linked to future job satisfaction and earnings. Evidence suggests that students take both factors into consideration. Indeed, while field of study choice is largely determined by students' individual preferences (Arcidiacono 2004), the expected earnings associated with a field is also an important consideration for most students (Gunderson and Krashinsky 2009). For this reason, producing quality evidence on the association between field of study and earnings has the potential to provide students with data that enable them to become better informed in their decision making.

Much of the existing literature provides earnings information for Canadian graduates by broad field of study, generally concluding that graduates of more applied fields, such as engineering, receive higher earnings than graduates of liberal arts fields (e.g., Finnie 2001; Finnie and Frenette 2003; Frank, Frenette and Morissette 2015; Frank and Walters 2012; Ostrovsky and Frenette 2014; Walters 2004).

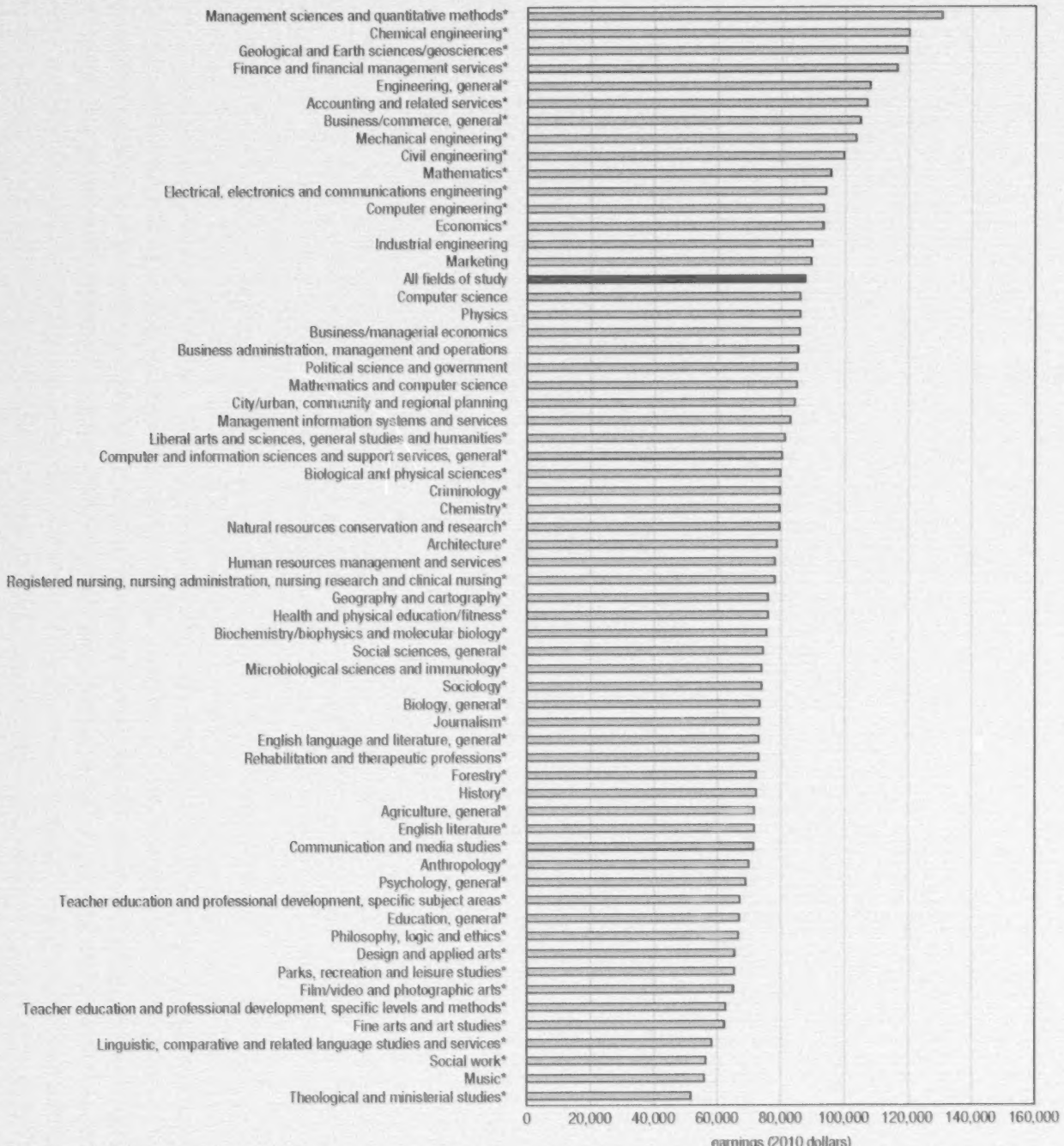
While results by broad field of study may be highly useful to policymakers and education planners, students are typically required to decide among very specific programs. Earnings by detailed fields can provide students with information that may facilitate these decisions. Results can also provide insight into the potential earnings advantages of additional education within specific fields. Findings from the 1996 Census indicate notable earnings differentials within specific fields by different levels of education (Stark 2007); however, more recent data are needed.

This study uses the 2011 National Household Survey to compare mean (or average) annual earnings by detailed field of study for bachelor's and master's degree graduates, as well as college graduates (see *Data sources, methodology and definitions*). Earnings across fields are presented separately for 25- to 54-year-old men and women who worked full year (49 to 52 weeks), full time (at least 30 hours per week) in 2010. Given the wide age range (necessary to produce adequate sample sizes), the results are age-adjusted. The fields of study are reported at the four-digit level of the 2011 Classification of Instructional Programs (CIP). This level of detail allows for useful comparisons within broad fields of study. For example, students interested in postsecondary programs in architecture and engineering may not only examine whether earnings differences exist between architecture and engineering graduates, but also between graduates of different types of engineering programs (e.g., civil, electrical and electronics, and mechanical). Note that results are only reported for fields with a sample size of 200 or more.[1]

Note that results are only age-adjusted within sex and education level groupings. For this reason, the analysis in this study focuses exclusively on comparisons across field of study for individuals of the same sex and with the same highest level of completed education. Comparisons between men and women would be particularly challenging since the data do not contain many of the key factors that have been associated with analyzing the gender wage gap, such as accumulated work experience, job tenure, unionization, working in a self-directed work group, work schedules and flexible work hours, overtime pay, firm size, working for a non-profit organization, foreign ownership, performance-based pay, and receipt of workplace training (see Drolet, 2002).

1. Results are not shown for doctoral and professional degree graduates since very few fields were retained with the sample criteria.

Chart 1
Mean age-adjusted earnings of male bachelor's degree graduates by field of study, 2010



* significantly different from reference category ($p<0.05$)

Notes: The 5% significance level indicates that the field of study is different than the average across all fields. The sample includes 25- to 54-year-olds who completed their highest level of education in Canada, who worked full year, full time (i.e., 49 to 52 weeks, mainly full time) as a paid employee, with positive wages and zero self-employment income. CIP: Classification of Instructional Programs.

Source: Statistics Canada, 2011 National Household Survey.

Management sciences and quantitative methods graduates highest earners among bachelor's degree holders

On average, 25- to 54-year-old male bachelor's degree graduates who worked full year, full time, in 2010, earned $87,543 in 2010 dollars (Chart 1).[2] Among them, management sciences and quantitative methods graduates earned the most—$130,547, or $43,004 more than the average male bachelor's degree graduate (after adjusting for age).[3] These graduates were followed closely by graduates of chemical engineering ($120,148), geological and earth sciences/geosciences ($119,397), and finance and financial management services ($116,473).[4] Of the 13 programs with above-average earnings,[5] 6 were in engineering and 4 were in business. Note that 2010 was in the midst of a recovery in natural resources prices, which may have benefited graduates from certain disciplines such as engineering and geology. More recently, world oil prices have declined (Gellatly 2015), and it remains to be seen how graduates in related fields have fared in the labour market.

At the other end of the spectrum, male bachelor's degree graduates from theological and ministerial studies earned the least ($51,791) after adjusting for age.[6] These graduates were followed closely by graduates from music ($55,942); social work ($56,407); and linguistics, comparative and related language studies and services ($58,301).

A key finding that emerges is that earnings varied considerably by specific fields, even within broad field groupings. For example, the primary 2011 CIP groupings combine architecture and engineering programs. However, while male graduates from all engineering programs but one earned more than the average male bachelor's degree graduate,[7] the average earnings of male architecture graduates was almost $9,000 below the overall average (after adjusting for age). Similarly, within the category of social and behavioural science and law,[8] economics was the only field in which men had above-average earnings ($93,256)—although male political science and government graduates were close to the average ($85,069). In contrast, male general psychology graduates earned $68,905 on average ($24,352 less than their counterparts in economics), and male sociology graduates earned $73,934 on average ($19,322 less than their economics counterparts). Similar findings hold for other broad field of study groupings—that is, the average earnings of graduates varied considerably across specific disciplines within the broader classification. This finding holds more generally by sex and education level.

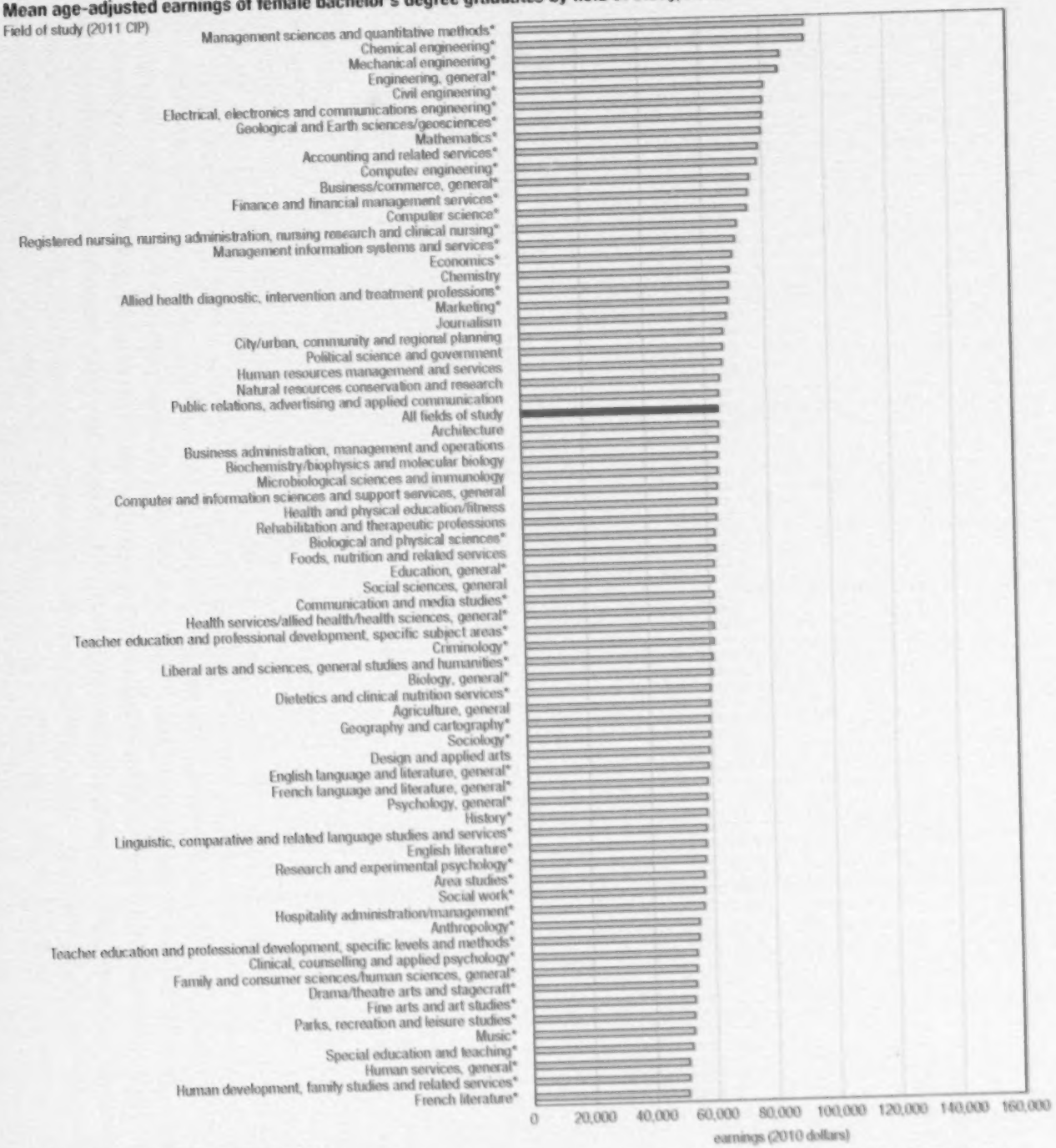
The relative results for women with a bachelor's degree bear striking similarities to the results for men. In Chart 2, the field associated with the highest age-adjusted earnings was management sciences and quantitative methods graduates ($94,525, which was about $30,000 above the average across all disciplines—$64,420).[9] This was followed closely by chemical engineering ($94,385), mechanical engineering ($86,549) and general engineering ($85,603). More generally, the fields associated with above-average pay for female bachelor's degree holders overlapped substantially with those for their male counterparts. This included many fields that women are typically less likely to choose than men, including several types of engineering programs, mathematics, and even geological and earth sciences/geosciences (a field that men are much more likely to select than women). Economics was also associated with the highest pay among social and behavioural science and law graduates for women (as was the case for men). Of the 18 disciplines associated with above-average earnings, 6 were in business and 6 were in engineering.

The fields associated with the lowest average earnings for female bachelor's degree graduates included French literature ($50,328), followed very closely by human development, family studies and related services ($50,607), general human services ($50,624), and special education and teaching ($50,927)[10]. Although the specific fields appearing at the very bottom were not the same for men and women, there was considerable overlap in the fields associated with below-average pay for both sexes.

Indeed, there were some notable differences in the fields of study associated with above- or below-average pay for male and female bachelor's degree holders. For example, male graduates of registered nursing, nursing administration, nursing research and clinical nursing programs earned $9,491 below the average for all male bachelor's degree graduates. In contrast, their female counterparts earned $7,026 above the average for all female bachelor's degree graduates. Similarly, male journalism graduates earned $14,326 below the average earnings of all male bachelor's degree graduates, while their female counterparts registered earnings that were close to the average.

2. Among disciplines with at least 200 observations. Note also that the overall average reflects the fact that most graduates take disciplines that are associated with higher pay.
3. Slightly more than one-half of these graduates (male and female) worked as mathematicians, statisticians and actuaries (according to the 2011 National Occupational Classification). No other occupation accounted for more than 7% of all graduates from this field.
4. Most of the focus in this study is on the fields associated with the highest and lowest earnings. Far more can be written about the many fields in between; however, to be concise, these fields are only mentioned to make very specific points (e.g., to demonstrate the difference in earnings across fields that have been grouped together in previous studies).
5. Fields of study with earnings that are statistically significant.
6. Students may choose a program based on many factors, including earnings potential, but overall job satisfaction (e.g., helping others) is also an important factor. In addition, many programs may have public benefits that cannot be fully captured by earnings.
7. Industrial engineering graduates was the exception, having earned about the same as the average graduate.
8. Note that graduates of LLB, JD and BCL programs were excluded from this analysis since they are professional programs. Legal studies programs (which are non-professional) were not excluded, but the sample sizes were too small for reporting purposes. See *Data sources, methodology and definitions* for additional details.
9. See the Introduction for the many reasons why comparisons should not be made between men and women with these data.
10. Note that average earnings in general education were higher, at $61,985.

Chart 2
Mean age-adjusted earnings of female bachelor's degree graduates by field of study, 2010



* significantly different from reference category ($p<0.05$)

Notes: The 5% significance level indicates that the field of study is different than the average across all fields. The sample includes 25- to 54-year-olds who completed their highest level of education in Canada, who worked full year, full time (i.e., 49 to 52 weeks, mainly full time) as a paid employee, with positive wages and zero self-employment income. CIP: Classification of Instructional Programs.

Source: Statistics Canada, 2011 National Household Survey.

Earnings highest among finance and financial management services graduates at the master's degree level

Turning to men with a master's degree, finance and financial management services graduates earned the most on average (after adjusting for age). Male graduates from this discipline earned $160,100 on average (in 2010 dollars), which was almost $50,000 more than the average across all fields of study (Chart 3). Of the five disciplines associated with above-average earnings, four were business-related, and the fifth was in engineering.[11]

The field associated with the lowest pay for male master's degree holders included theological and ministerial studies ($50,184), and is followed by social work ($62,958), library science and administration ($66,456), and general psychology ($74,091).

One notable difference between the results for male bachelor's and master's degree holders relates to engineering graduates. At the bachelor's degree level, graduates from six out of seven of the different types of engineering programs registered above-average earnings in 2010 (the seventh registered average earnings). Among male master's degree holders, graduates from only one out of the six engineering programs with sufficient samples registered above-average earnings (general engineering).

Women who graduated with a master's degree in finance and financial management services also earned the most at their level—$111,714 (Chart 4). They were followed closely by three other business-related disciplines: general business/commerce ($111,327), business administration, management and operations ($99,367), and accounting and related services ($99,060).

The fields associated with the lowest pay for women with a master's degree included theological and ministerial studies ($49,415), followed by student counselling and personnel services ($59,944); linguistic, comparative and related language studies and services ($62,614); and teacher education and professional development, specific levels and methods ($65,342).

One interesting difference between men and women with a master's degree relates to the public administration results. Male graduates from that discipline earned almost $17,000 less than the average male master's degree graduate. In contrast, female public administration graduates earned more than $4,000 above the average female master's degree graduate.

Less earnings variation across fields among college graduates

In general, there was far less earnings variation across specific fields of study among college graduates than among bachelor's and master's degree graduates.

More specifically, male college graduates from 61 of the 93 fields (66%) earned within $10,000 (in 2010 dollars) of the overall average after adjusting for age (Chart 5), compared with 23 of the 61 programs (38%) among male bachelor's degree graduates (Chart 1) and 6 of the 30 programs (20%) among male master's degree graduates (Chart 3). Similarly, female college graduates from 61 of the 75 fields (81%) earned within $10,000 of the overall average (Chart 6), compared with 46 of the 69 disciplines (67%) among female bachelor's degree graduates (Chart 2) and 17 of the 34 programs (50%) among female master's degree graduates (Chart 4).

That being said, the field associated with the highest average earnings among male college graduates was mining and petroleum technologies/technicians ($102,986), while the lowest was health aides/attendants/orderlies ($45,193).

Among female college graduates, average earnings ranged from $63,721 for criminology graduates to $36,158 for cosmetology and related personal grooming services.

Another notable difference between the college and university results is the fact that business graduates fared much better at the university level than at the college level. Indeed, university business graduates registered average earnings that were often near the top among all disciplines. In contrast, the average earnings of college business graduates were much closer to the overall college average.

Conclusion

The objective of this study has been to compare the age-adjusted earnings observed among full-time, full-year employees disaggregated by detailed fields of study. More specifically, specific fields of study were ranked according to age-adjusted earnings by sex and education level. Such information provides more useful information to students faced with making program choices than earnings data classified by broader categories.

One of the key findings that emerges from the study is the high degree of variability in earnings by specific field of study. For example, although engineering graduates are often grouped with architecture graduates, engineering graduates generally earn considerably more. Similarly, economics graduates typically earn far more than psychology graduates, yet both are often grouped together under social sciences.

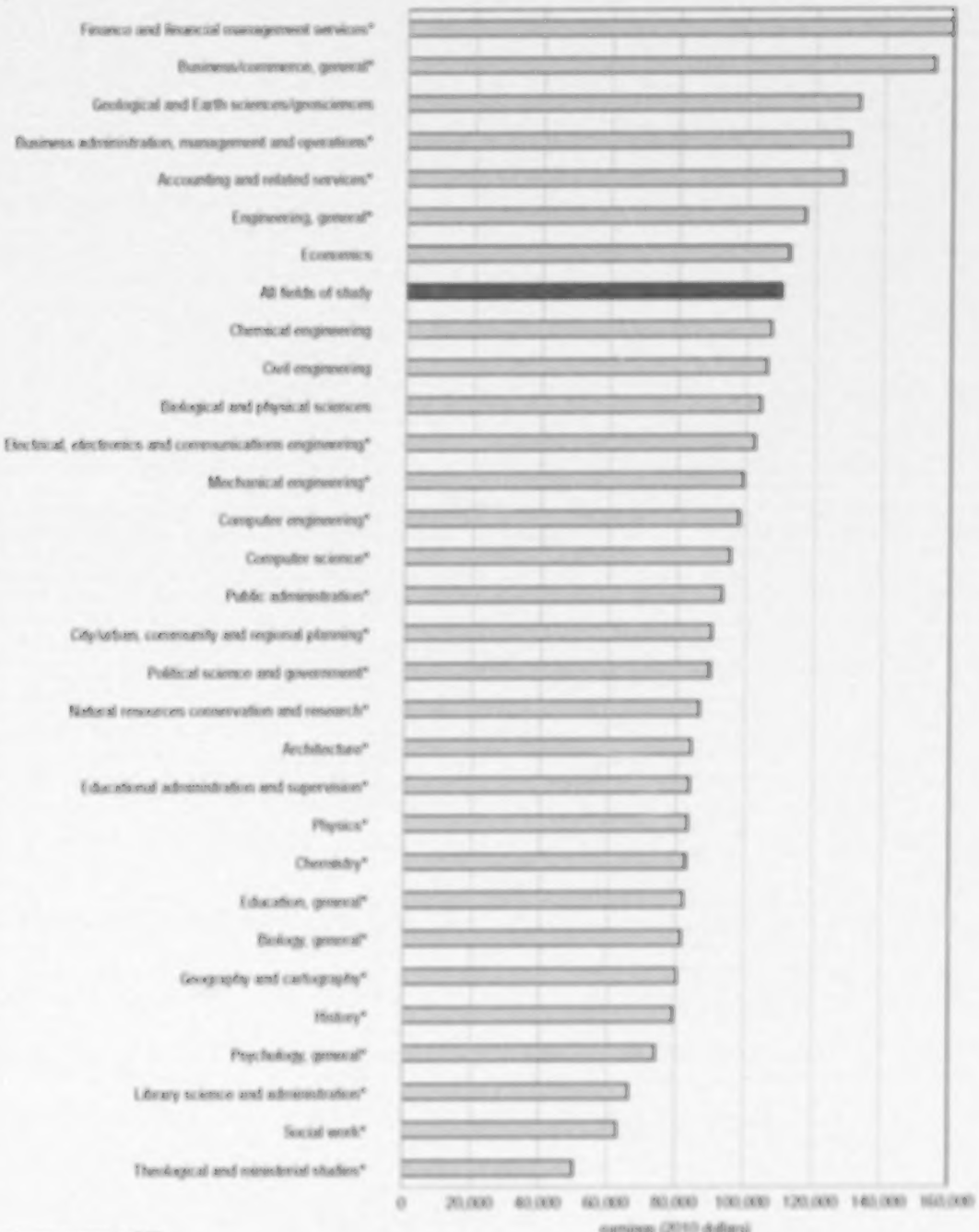
The relative ranking for certain disciplines depended on the level of study. For example, engineering graduates were typically ranked above average at the bachelor's degree level. However, at the master's degree level, male engineering graduates generally registered below-average earnings. Similarly, university business graduates often ranked near the top of the earnings ladder, but at the college level, they were generally closer to the average.

The range of earnings associated with the fields was much smaller among college graduates than among their university counterparts. Male and female college graduates in most disciplines earned, on average, within $10,000 of the overall average.

Given the insights provided in this study, future analysis carried out by field of study may benefit from a similar level of detail whenever possible. ■

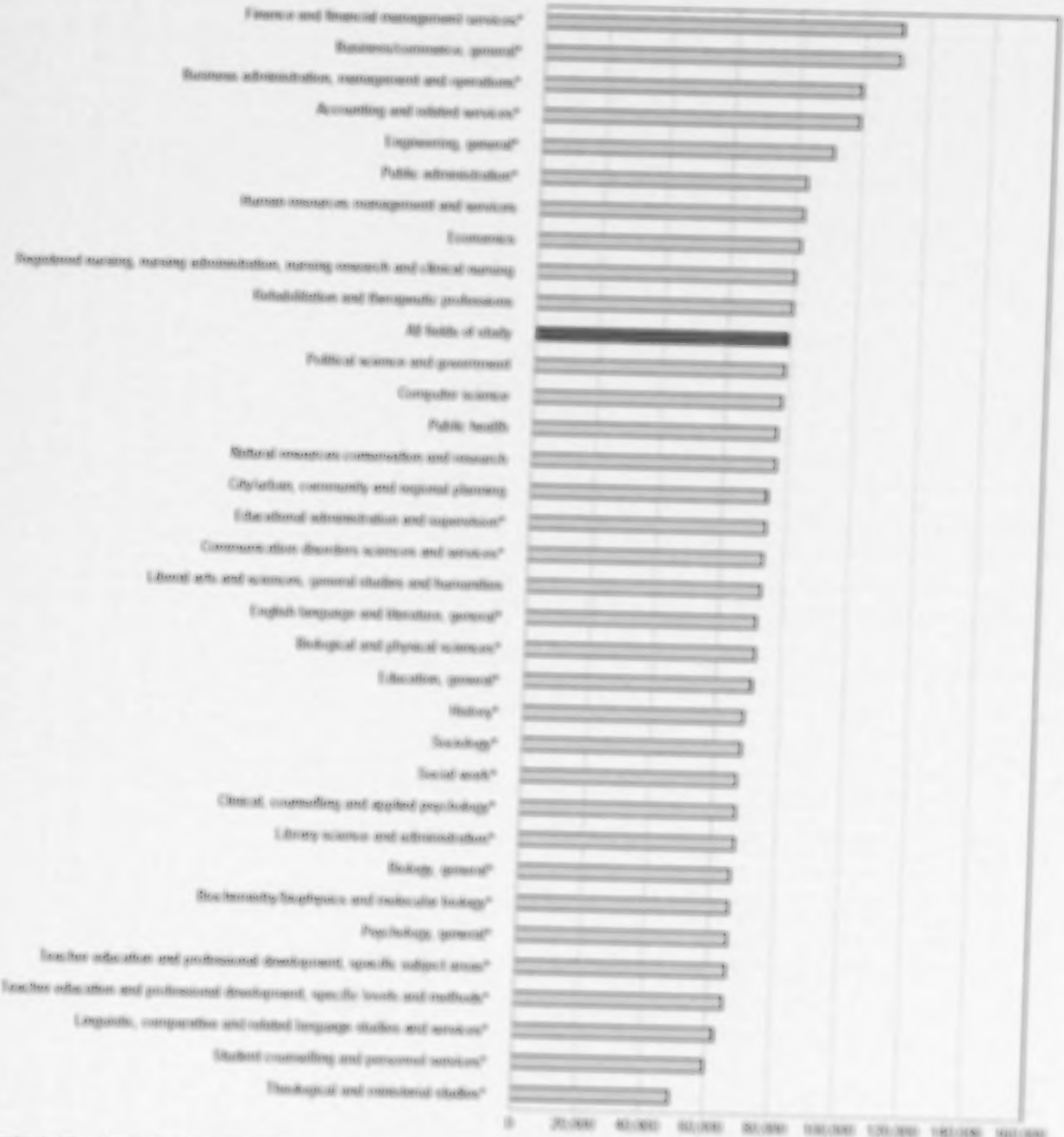
11. Note that graduates of geological and Earth sciences/geosciences earned $132,787 on average, which was more than $30,000 above the average earnings among male master's degree graduates. However, this difference was not statistically significant.

Chart 3
age-adjusted earnings of male master's degree graduates by field of study, 2010
Field of study (2011 CIP)



* significantly different from reference category (p<0.05)
Notes: The 5% significance level indicates that the field of study is different than the average across all fields. The sample includes 25- to 54-year-olds who completed their highest level of education in Canada, who worked full year, full time (i.e., 49 to 52 weeks, mainly full time) as a paid employee, with positive wages and zero self-employment income. CIP: Classification of Instructional Programs.
Source: Statistics Canada, 2011 National Household Survey

Chart 4
Mean age-adjusted earnings of female master's degree graduates by field of study, 2010
Field of study (2011 CIP)

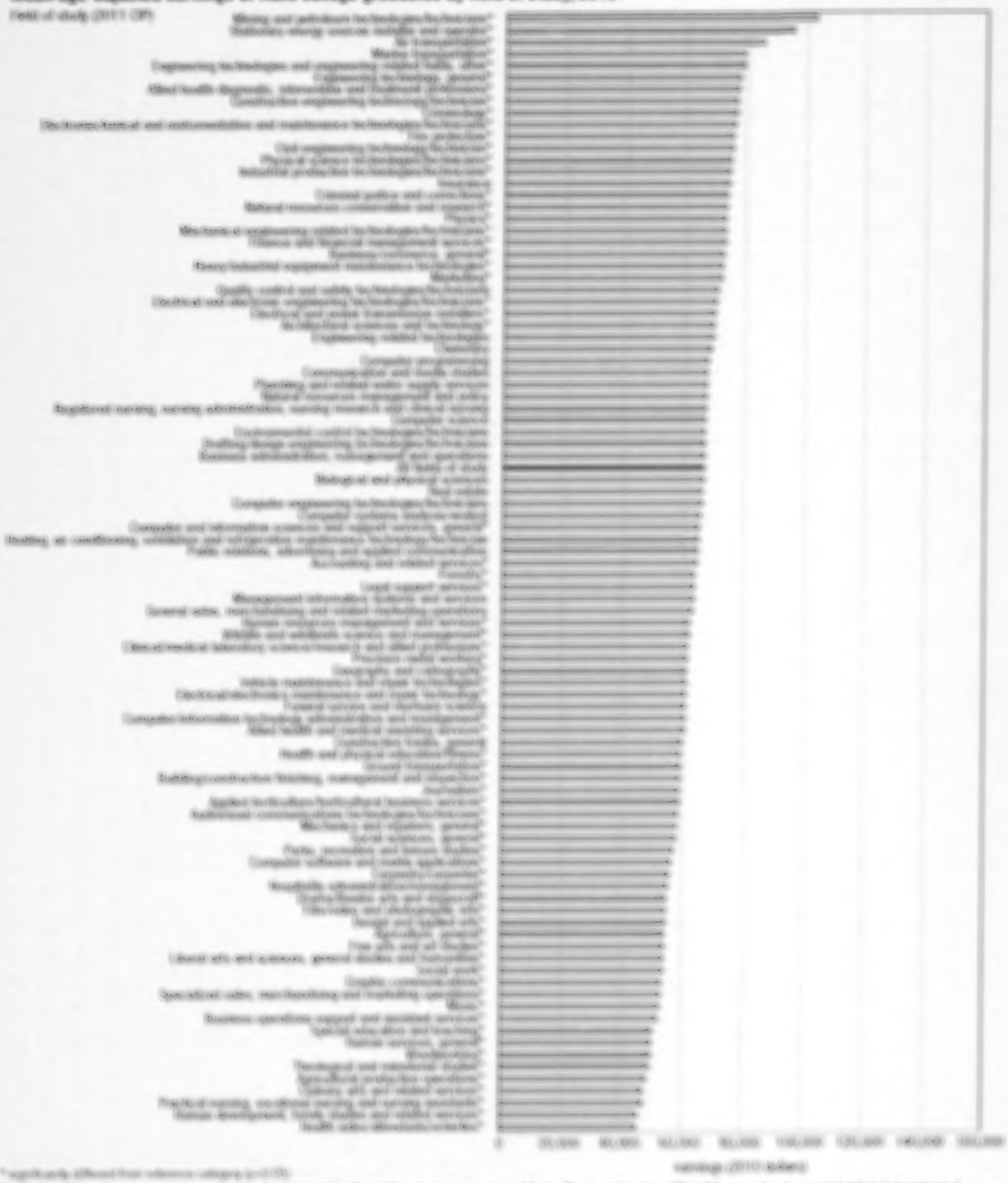


* significantly different from reference category (p<0.05)

Notes: The 5% significance level indicates that the field of study is different than the average across all fields. The sample includes 25- to 54-year-olds who completed their highest level of education in Canada, who worked full year, full time (i.e., 49 to 52 weeks, mainly full time) as a paid employee, with positive wages and core self-employment income. CIP: Classification of Instructional Programs.

Sources: Statistics Canada, 2011 National Household Survey

Chart 8
Mean age-adjusted earnings of male college graduates by field of study, 2010

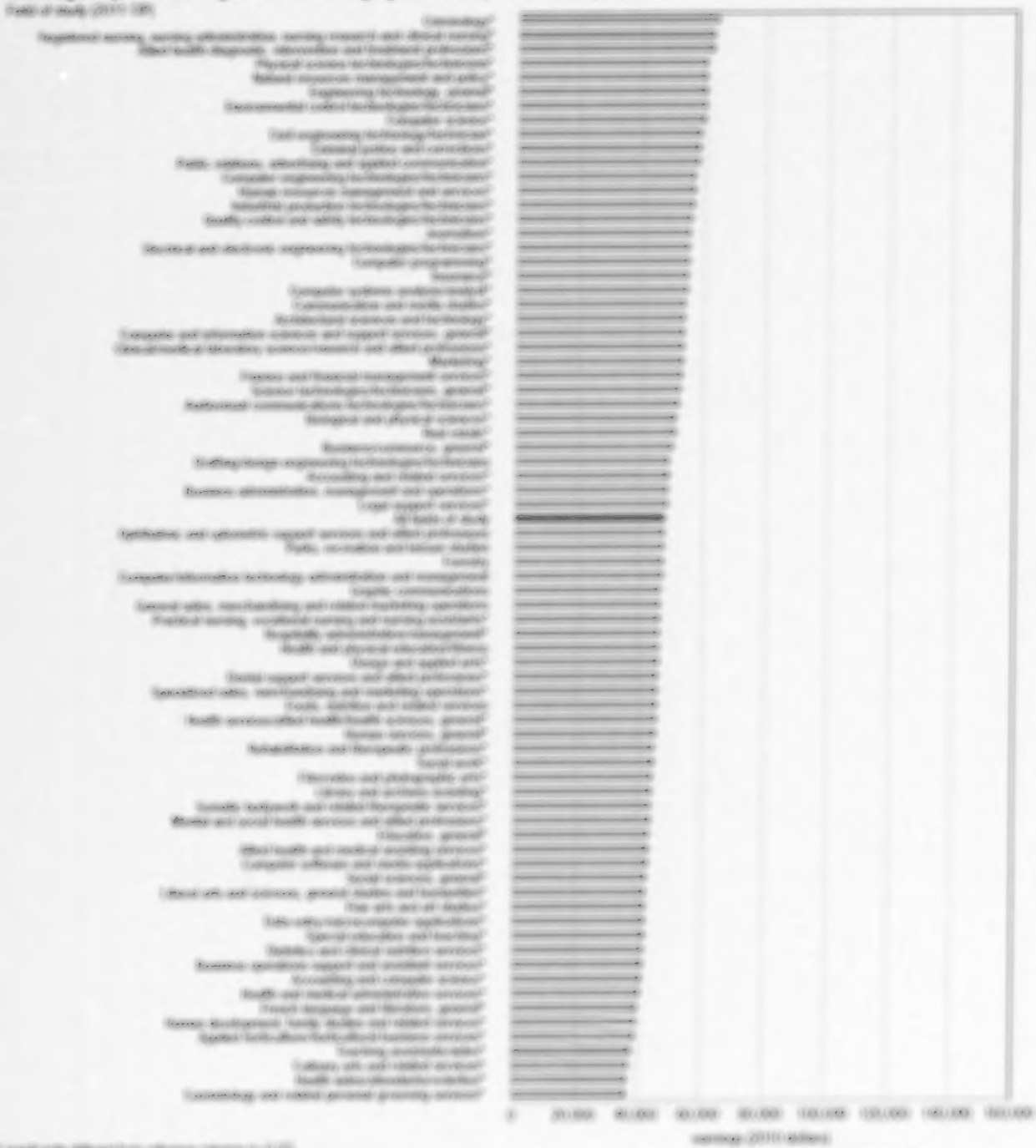


* significantly different from reference category (p < 0.05)

Notes: The 0% significance level indicates that the field of study is different than the average across all fields. The sample includes 25- to 54-year-olds who completed their highest level of education in Canada, who worked full year, full time (i.e., 40 to 52 weeks, mostly full time) as a paid employee, with positive wages and zero self-employment income. CIP: Classification of Instructional Programs.

Source: Statistics Canada, 2011 National Household Survey.

Chart 6
Mean age-adjusted earnings of female college graduates by field of study, 2010



* significantly different from reference category (p < 0.05)

Notes The 15k significance level indicates that the field of study is different than the average or rest of fields. The sample includes 25- to 34-year olds who completed their highest level of education in Canada, who worked full year, full time (i.e., 40 to 52 weeks, mainly full time) as a paid employee, with positive wages and zero self-employment income. CIP: Classification of Instructional Programs.

Sources Statistics Canada, 2011 National Household Survey.

Table 1
Mean age-adjusted earnings of men and women, by field of study, 2010

CIP code	Field of study	College		Bachelor's		Master's	
		Men	Women	Men	Women	Men	Women
				earnings (2010 dollars)			
1.00	Agriculture, general	34,000		71,000	59,000		
1.03	Agricultural production operations	40,000					
1.06	Applied horticulture/horticultural business services	35,000	35,000				
3.01	Natural resources conservation and research	72,000		75,000	65,000	85,000	75,000
3.05	Natural resources management and policy	67,000	65,000				
3.05	Forestry	65,000	61,000	72,000			
3.06	Wildlife and wildlands science and management	61,000					
4.00	Architecture			76,000	66,000	94,000	
4.03	City/urban, community and regional planning			66,000	66,000	80,000	74,000
4.05	Architectural sciences and technology	59,000	53,000				
5.01	Area studies				56,000		
5.01	Communication and media studies	57,000	53,000	71,000	65,000		
5.09	Journalism	59,000	52,000	70,000	67,000		
5.09	Public relations, advertising and applied communication	58,000	57,000		58,000		
10.02	Audiovisual communications technologies/technicians	55,000	51,000				
10.03	Graphic communications	53,000	45,000				
11.01	Computer and information sciences and support services, general	65,000	63,000	80,000	69,000		
11.02	Computer programming	67,000	59,000				
11.05	Computer systems analysis	65,000	58,000				
11.06	Data entry/microcomputer applications		52,000				
11.07	Computer science	66,000	59,000	85,000	74,000	90,000	77,000
11.08	Computer software and media applications	64,000	56,000				
11.10	Computer/information technology administration and management	62,000	57,000				
12.03	Funeral service and mortuary science	49,000					
12.04	Cosmetology and related personal grooming services		36,000				
13.01	Library and related services	57,000	51,000				
13.01	Education, general		60,000	80,000	61,000	85,000	71,000
13.09	Educational administration and supervision					90,000	82,000
13.10	Special education and teaching	60,000	51,000		61,000		
13.11	Student counselling and personnel services						59,000
13.12	Teacher education and professional development, specific levels and methods			60,000	60,000		80,000
13.13	Teacher education and professional development, specific subject areas			61,000	61,000		80,000
13.14	Teaching assistants/aides		51,000				
14.01	Engineering, general			82,000	65,000	110,000	91,000
14.07	Chemical engineering			105,000	90,000	92,000	
14.08	Civil engineering			82,000	64,000	100,000	
14.09	Computer engineering			85,000	75,000	95,000	
14.10	Electrical, electronics and communications engineering			90,000	80,000	100,000	
14.19	Mechanical engineering			84,000	65,000	95,000	
14.35	Industrial engineering			86,000			
15.00	Engineering technology, general	51,000	50,000				
15.03	Civil engineering technology/technician	70,000	59,000				
15.04	Electrical and electronic engineering technologies/technicians	70,000	59,000				

Table 6

Mean age-adjusted earnings of men and women, by field of study, 2010 (continued)

ASCED code	Field of study	Earnings		Hourly rate		Weekly hours	
		Men	Women	Men	Women	Men	Women
				(earnings in 2010 dollars)			
0103.00	Electronics, electrical and telecommunications and maintenance technologies/technicians	55,100					
0104.00	Instrumentation control technologies/technicians	65,700	55,800				
0105.00	Industrial production technologies/technicians	61,600	55,300				
0106.00	Quality control and safety technologies/technicians	72,000	62,800				
0199.00	Mechanical engineering related technologies/technicians	71,800					
0199.00	Mining and petroleum technology/technicians	100,000					
0199.00	Aeronautical engineering technology/technicians	70,600					
0199.00	Engineering related technologies	69,000					
0199.00	Computer engineering technologies/technicians	65,000	60,900				
0199.00	Building/design engineering technologies/technicians	65,000	58,000				
0199.00	Engineering technologies and engineering related fields, nfdd	73,000					
0201.01	Linguistic, comparative and related language studies and services			36,400	32,900		38,600
0201.02	Classical and ancient studies/literature, general				35,300		
0202.00	Creative, scientific and related services		35,200		36,000		
0203.00	Human development, teaching studies and related services	48,600	35,200		33,800		
0204.00	Legal support services	54,600	36,900				
0205.01	English language and literature, general			34,800	36,900		35,000
0205.02	English literature			34,000	32,100		
0206.01	Liberal arts and sciences, general studies and humanities	53,600	42,000	35,200	36,000		34,100
0207.01	Library science and administration					36,000	37,000
0207.02	Library and archives assisting		34,000				
0208.01	Biology, general			34,800	36,300	39,900	36,400
0208.02	Biochemistry/biophysics and molecular biology			34,000	34,900		36,000
0208.03	Microbiological sciences and immunology			34,900	34,900		
0211.01	Mathematics			36,000	39,600		
0299.00	Biological and physical sciences	66,000	45,600	39,600	36,200	40,000	37,000
0299.00	Mathematics and computer science			36,000			
0299.00	Accounting and computer science		34,000				
0301.01	Data, recreation and fitness studies	51,000	41,000	35,000	32,100		
0301.02	Health and physical education fitness	55,000	36,000	32,000	35,000		
0302.01	Philosophy, logic and ethics			36,000			
0303.00	Theological and ministerial studies	56,000		34,700		39,000	39,000
0304.00	Planning	60,000		39,000	36,000	39,000	
0305.00	Aboriginal and Torres Strait Islander languages/cultures			39,000	36,000	39,000	
0306.00	Physics	72,000		36,000		39,000	
0307.00	Science technologies/technicians, general		35,000				
0308.00	Physical science technologies/technicians	60,000	55,000				
0309.01	Psychology, general			36,000	36,000	39,000	36,000
0309.02	Research and experimental psychology				34,000		
0309.03	Clinical, counselling and applied psychology				35,000		36,000
0310.00	Criminal justice and corrections	70,000	55,000				
0399.00	Fire protection	70,000					
0401.00	Human services, general	55,000	36,000		34,000		

Table 1
Mean age-adjusted earnings of men and women, by field of study, 2010 (continued)

CIP Code	Field of Study	College		Bachelors		Masters	
		Men	Women	Men	Women	Men	Women
				earnings (2010 dollars)			
44.04	Public administration					93,377*	83,190*
44.07	Social work	53,919*	44,548*	56,807*	50,717*	62,958*	57,453*
45.01	Social sciences, general	57,877*	42,669*	74,354*	61,836		
45.02	Anthropology			69,949*	54,901*		
45.04	Criminology	70,813*	63,721*	79,744*	61,810*		
45.06	Economics			93,256*	60,814*	112,519	81,982
45.07	Geography and cartography	61,151*		78,031*	59,713*	80,344*	
45.10	Political science and government			85,069	66,182	89,773*	78,393
45.11	Sociology			73,934*	58,502*		68,619*
46.00	Construction trades, general	58,776					
46.02	Carpentry/carpenter	55,822*					
46.03	Electrical and power transmission installers	70,034*					
46.04	Building/construction finishing, management and inspection	58,263*					
46.05	Plumbing and related water supply services	67,399					
47.00	Mechanics and repairers, general	58,729*					
47.01	Electrical/electronics maintenance and repair technology	60,968*					
47.02	Heating, air conditioning, ventilation and refrigeration maintenance technology/technician	64,982					
47.03	Heavy/industrial equipment maintenance technologies	72,339*					
47.05	Stationary energy sources installer and operator	95,567*					
47.06	Vehicle maintenance and repair technologies	61,136*					
48.05	Precision metal working	61,442*					
48.07	Woodworking	49,989*					
49.01	Air transportation	85,556*					
49.02	Ground transportation	58,300*					
49.03	Marine transportation	79,132*					
50.04	Design and applied arts	54,690*	45,980*	65,476*	59,240		
50.05	Drama/theatre arts and stagecraft	54,825*			53,412*		
50.06	Film/video and photographic arts	54,651*	44,102*	64,988*			
50.07	Fine arts and art studies	54,032*	42,052*	62,199*	53,040*		
50.09	Music	52,817*		55,942*	52,516*		
51.00	Health services/allied health/health sciences, general		45,423*		61,677*		
51.02	Communication disorders sciences and services						73,463*
51.06	Dental support services and allied professionals		45,753*				
51.07	Health and medical administrative services		60,636*				
51.09	Allied health and medical assisting services	60,631*	42,676*				
51.10	Allied health diagnostic, intervention and treatment professions	77,288*	62,415*		68,532*		
51.11	Clinical/medical laboratory science/research and allied professions	61,533*	53,321*				
51.15	Mental and social health services and allied professions		63,645*				
51.18	Ophthalmic and optometric support services and allied professions		67,481				
51.22	Public health						70,621
51.23	Rehabilitation and therapeutic professions		44,654*	72,858*	63,113		80,890
51.26	Health aides/attendants/orderlies	45,193*	36,485*				
51.31	Dietetics and clinical nutrition services		61,547*		60,141*		

Table 1
Mean age-adjusted earnings of men and women, by field of study, 2010 (concluded)

CIP Code	Field of Study	College		Bachelors		Masters	
		Men	Women	Men	Women	Men	Women
		earnings (2010 dollars)					
51.35	Somatic bodywork and related therapeutic services		43,670*				
51.38	Registered nursing, nursing administration, nursing research and clinical nursing	67,023	62,441*	78,052*	71,446*		80,615
51.39	Practical nursing, vocational nursing and nursing assistants	47,186*	46,093*				
52.01	Business/commerce, general	72,607*	50,119*	104,880*	75,905*	154,758*	111,327*
52.02	Business administration, management and operations	66,646	48,487*	85,318	64,126	129,882*	99,367*
52.03	Accounting and related services	64,401*	48,767*	107,020*	78,802*	128,310*	99,060*
52.04	Business operations support and assistant services	52,141*	41,357*				
52.05	Business/managerial economics			85,888			
52.08	Finance and financial management services	73,266*	52,879*	116,473*	75,266*	160,100*	111,714*
52.09	Hospitality administration/management	55,439*	46,080*		56,537*		
52.10	Human resources management and services	62,025*	56,541*	78,152*	65,867		82,610
52.12	Management information systems and services	63,412		82,950*	70,790*		
52.13	Management sciences and quantitative methods			130,547*	94,525*		
52.14	Marketing	72,064*	53,225*	89,383	68,266*		
52.15	Real estate	66,037	50,931*				
52.17	Insurance	74,334	54,611*				
52.18	General sales, merchandising and related marketing operations	62,943	46,297				
52.19	Specialized sales, merchandising and marketing operations	53,149*	45,620*				
54.01	History			72,167*	58,131*	79,406*	69,039*
55.01	French language and literature, general		39,698*		58,490*		
55.14	French literature				50,328*		
	All fields of study	**66,611**	**47,582**	**87,543**	**64,420**	**119,199**	**78,768**

* significantly different from average earnings across all fields of study ($p < 0.05$)
Notes: Blank cells indicate insufficient sample size. CIP: Classification of Instructional Programs
Source: Statistics Canada, 2011 National Household Survey

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Data sources, methodology and definitions

Data sources

This study uses data from Statistics Canada's 2011 National Household Survey (NHS). The sample includes men and women aged 25 to 54 whose highest level of postsecondary studies were completed in Canada. In addition, only those who had positive wages, no self-employment income, worked as paid employees, and had full-year, full-time employment (i.e., they worked 49 to 52 weeks, mainly 30 hours or more per week) are included.

Only graduates from fields with 200 or more observations in the sample are retained for analysis. The resulting sample sizes were largest for college graduates, with 138,102 women and 129,843 men; among bachelor's degree holders, there were 105,129 women and 92,489 men. Sample sizes for master's degree holders are similar for women (19,226) and men (19,996). Based on the sample criteria, very few fields would have been retained for doctoral and professional degree holders, therefore they are not included in this study.

Methodology

The results presented in this study are based on age-adjusted regression coefficients estimated by multiple classification analysis (MCA)—a technique that removes the arbitrariness associated with selecting a reference category for the fields of study (Andrews et al. 1967). The approach begins by running an ordinary least squares regression with one omitted category (as per usual). Each coefficient is then adjusted (including the one associated with the omitted category, which is set to zero) by subtracting from each of them the value of the linear combination of all of the coefficients associated with each category and their relative population share. The standard errors can then be estimated with a non-parametric bootstrapping approach. Although it is not strictly necessary, bootstrapping the standard errors accounts for the stratification inherent in the NHS. A total of 30 bootstrap iterations were applied in the study.

The resulting coefficients obtained from the MCA models are interpreted as a difference from the average earnings of individuals within a given group based on sex and education level. These coefficients were then used to calculate the average predicted earnings (in 2010 dollars) of graduates from each field of study, assuming they were all the same age (which was the average age for their sex and level).

Definitions

Bachelor's degree: A university degree at the undergraduate level, based on the highest certificate or degree. It excludes university certificates above or below a bachelor's degree, and first professional degrees in medicine, dentistry, veterinary medicine or optometry. Graduates of LLB, JD and BCL programs, and legal research and advanced professional studies (post-LLB/JD) programs, as well as pharmacy, pharmaceutical sciences and administration programs were also excluded from the analysis as these are typically associated with professional degrees.

College certificate: A certificate awarded by a college, CEGEP or other non-university institution (excluding registered apprenticeships or trades certificates), based on the highest certificate or degree.

Field of study: The field of study is based on the 2011 Classification of Instructional Programs (CIP) Canada codes, available for the highest certificate or degree in the 2011 National Household Survey. Fields are reported at the detailed subseries (four-digit) level (Statistics Canada 2011).

Master's degree: A university degree at the graduate level, based on the highest certificate or degree.